

CLAIMS:

1. An optical scanning device for scanning a surface along a line, which device comprises a radiation source unit for supplying at least one primary radiation beam, an optical system for focusing the beam to a spot on the surface to be scanned, and a rotatable polygon mirror comprising a number of mirror facets for deflecting the beam through a variable deflection angle, thereby obtaining a scanning beam, and to direct the scanning beam to a position on the surface to be scanned, said optical system comprising a main imaging system which is arranged in the radiation path of the scanning beam between the radiation source unit and the polygon mirror and a correction system which is arranged in the radiation path of the scanning beam between the polygon mirror and the surface to be scanned, characterized in that it comprises facet tracking means for deflecting the primary focused beam in synchronism with rotation of the polygon mirror such that the chief ray of the primary beam is continuously directed at substantially the centre of that facet that is momentarily illuminated by the primary beam.
2. A scanning device as claimed in claim 1, characterized in that the tracking means are operable to create a deflection point for the scanning beam, which point is located between a centre of rotation of the polygon mirror and the mirror facet upon which the primary beam is momentarily incident.
3. A scanning device as claimed in claim 1 or 2, characterized in that the facet tracking means are active tracking means, which are constituted by a beam deflector arranged in the radiation path between the radiation source unit and the main imaging system.
4. A scanning device as claimed in claim 3, characterized in that an additional lens is arranged between the beam deflector and the main imaging system to magnify the deflection produced by the beam deflector.
5. A scanning device as claimed in claim 3 or 4, characterized in that the beam deflector comprises a galvanometer mirror.

6. A scanning device as claimed in claim 3 or 4, characterized in that the beam deflector comprises a piezo electric deflector.
- 5 7. A scanning device as claimed in claim 3 or 4, characterized in that the beam deflector comprises an acousto-optical deflector.
8. A scanning device as claimed in claim 3 or 4, characterized in that the beam deflector comprises an electro-optical deflector.
- 10 9. A scanning device as claimed in claim 1 or 2, characterized in that the facet tracking means are passive means comprising a facet tracking mirror, which receives the primary beam via a first reflection at the mirror facet and reflects the beam to the mirror facet for a second reflection at this facet to deflect the primary beam at an angle substantially
15 smaller than the deflection angle of the scanning beam, before guiding the primary beam to the main imaging system.
10. A scanning device as claimed in claim 9, characterized in that the facet-tracking mirror is a concave mirror.
- 20 11. A scanning device as claimed in claim 10, characterized in that the centre of curvature of the concave mirror is located close to the rotational axis of the polygon mirror.
12. An apparatus for processing a pattern in at least a surface layer of an object,
25 which apparatus comprises a device for scanning the object surface with a radiation beam and means to modulate the intensity of the beam according to the pattern, characterized in that the device is a scanning device as claimed in any one of claims 1-11.
13. An apparatus for point-wise retrieving details of an object, which apparatus
30 comprises a device for scanning the object with a beam of radiation and a radiation-sensitive detection system to convert radiation from the object into an electrical signal, characterized in that the device is a scanning device as claimed in any one of claims 1-11.

14. An apparatus as claimed in claim 13, characterized in that the radiation-sensitive detection system and the scanning device are arranged at the same side of the object.

- 5 15. An apparatus as claimed in claim 13, characterized in that the radiation-sensitive detection system is arranged at the position of a radiation source of the scanning device and radiation source is arranged at the side of the object remote from the scanning device.